30178

Standard Aircraft Characteristics

BY AUTHORITY OF
THE SECRETARY
OF THE AIR FORCE

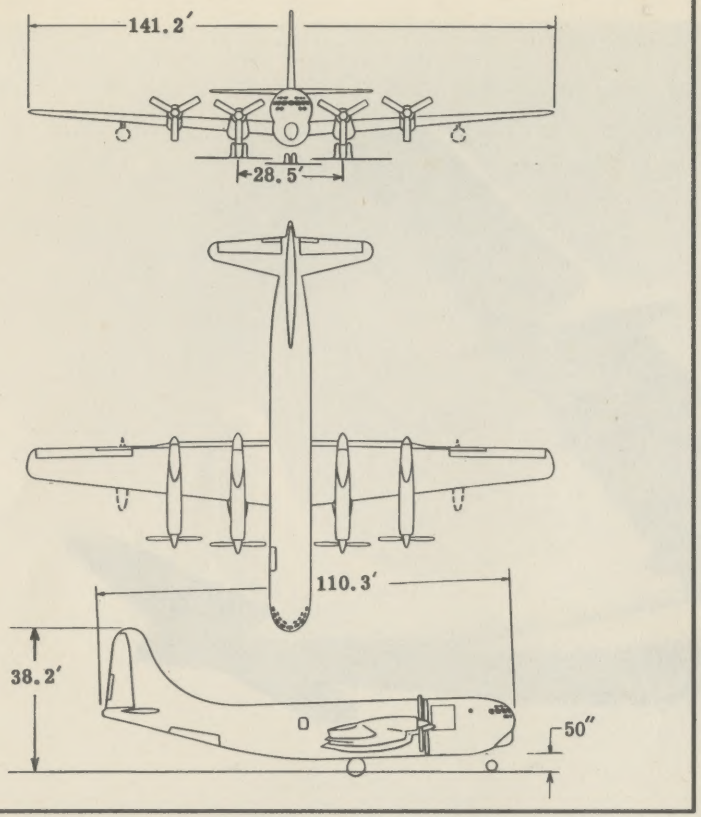
YC-97J

STRATOFREIGHTER

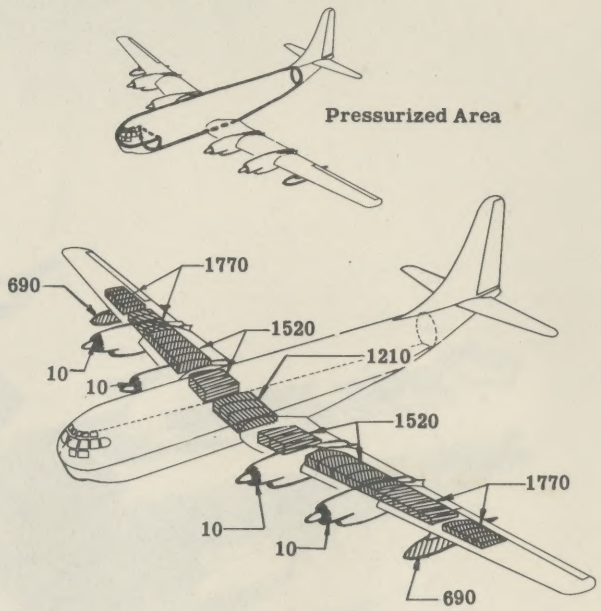
Boeing

FOUR YT34-P-5
PRATT & WHITNEY

4 SEP 56

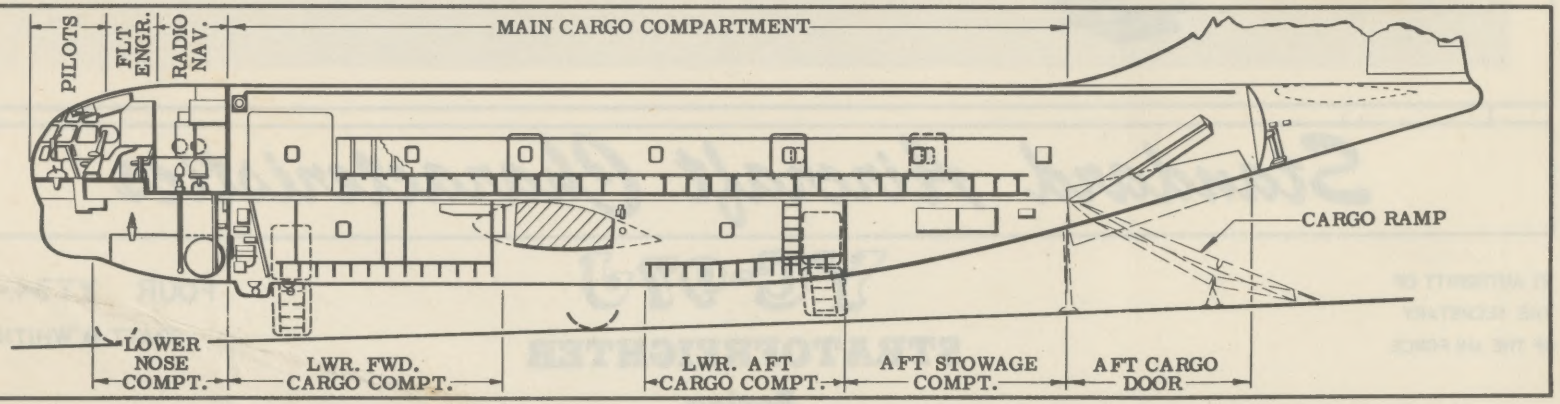


Wing Area (true) . . . . 1768.7 sq ft
Aspect Ratio 11.6
Wing Section . . . . Boeing 117
M.A.C. . . . . 154.4 in.



Fuel (Gal)

Oil (Gal)



POWER PLANT

Nr. & Model	(4) YT34-P-5
Mfr	Pratt & Whitney
Engine Spec. Nr.	A-3534
Type	Axial
Tail Pipe	Fixed
Red. Gear Ratio	0.0909
Prop. Mfr	Curtiss Wright
Blade Design Nr.	1060-20C5-42
Prop. Type	CT735S-B104
Nr. Blades	3
Prop. Dia	15'6"

ENGINE RATINGS

	S.L.S. ESHP-SHP-LB-RPM-MIN
T.O:	5700 - 5200-1250-11,000-5
Mil:	5500 - 5040-1150-11,000-30
Nor:	4950 - 4500-1125-10,750-Cont

Mission and Description

Navy Equivalent: None

Mfr's Model: 367-86-66

The principal mission of the YC-97J is to provide a flight test bed for Pratt and Whitney T-34 turboprop engines. The airplane will flight test the turbo-prop engines and their associated systems over similar routes and operating conditions existent with present C-97 type airplanes and at speeds and altitudes for which turboprop engines are designed.

The airframe is a modification of the completed KC-97G airplane and includes a standard kit conversion to the cargo configuration. Changes to the airframe have been limited to modification of the nacelles. In the cargo configuration space is available in the main compartment for carrying such major items of cargo as aircraft engines, standard AF split cargo bins, ground power units, etc. A wide variety of floor and side-wall tie-down fittings are provided in the aircraft for securing all types of cargo. (See Note (c), page 6.)

The YC-97J retains the convertibility features of its predecessor, KC-97G, in that it may be converted into a tanker.

Development

Design Initiated	Jul 53
Contract Approved	Sep 53
Mock-Up	Dec 53
First Flight	Feb 55
Delivery	Jun 55

WEIGHTS

Loading	Lb	L.F.
Empty	72,188(C)	
Basic	75,370(C)	
Design	153,000	2.5
Combat	*95,670	
Max T.O. (ov'ld)	†175,000	2.0
Max T.O. (nor)	†153,000	2.5
Max Landing	†175,000	

(C) Calculated
* For Basic Mission
† Limited by strength

FUEL

Location	Nr. Tanks	Gal
Wg, outbd	2	3540
Wg, inbd	2	3040
Wing, ext	2	1380
Wing, ctr	1	1210
	Total	9170
Grade		JP-4
Specification		MIL-F-5624

OIL

Nacelles	4	(tot) 40
Specification		MIL-L-7808

DIMENSIONS

Wing	
Span	141.2'
Incidence (root)	4°
(tip)	4°
Dihedral	4°30'
Sweepback (LE)	7°1'
Length	110.3'
Height	38.2'
Height (Fin Folded)	26.7'
Tread	28.5'
Prop Grd Clearance	50"

CAPACITIES

INSIDE CLEARANCES

Upper Deck:	
Length (overall)	63.6'
Width (floor level)	8.8'
Height	8.0'

MAIN CARGO DOORS

	FWD	AFT
Max Fwd Width	9.3'	
Max Aft Width	6.4'	
Height (max)	6.5'	
Length (max)	6.7'	14.3'

LIMIT FLOOR LOADS

Main Deck . . . . . 200 lb/sq ft

Max Cargo Capacity - see "Payload-Distance" graph, page 5.

PERSONNEL

Crew (normal) 4

Pilot
Co-Pilot
Flight Engineer
Navigator

ELECTRONICS

VHF Command	AN/ARC-3
UHF Command	AN/ARC-27
HF Command, Trans.	AN/ART-13A
HF Command, Rec.	BC-454B
Liaison	AN/ARC-21
Interphone	AN/AIC-10
Radio Compass	AN/ARN-6
Marker Beacon	AN/ARN-12
Glide Path	AN/ARN-18
Radio Altimeter(High)	SCR-718
Radio Altimeter(Low)	AN/APN-1
Omni-Direc. Range	AN/ARN-14
Loran	AN/APN-70
Radio Set (IFF)	AN/APX-6
Search Radar	AN/APS-42

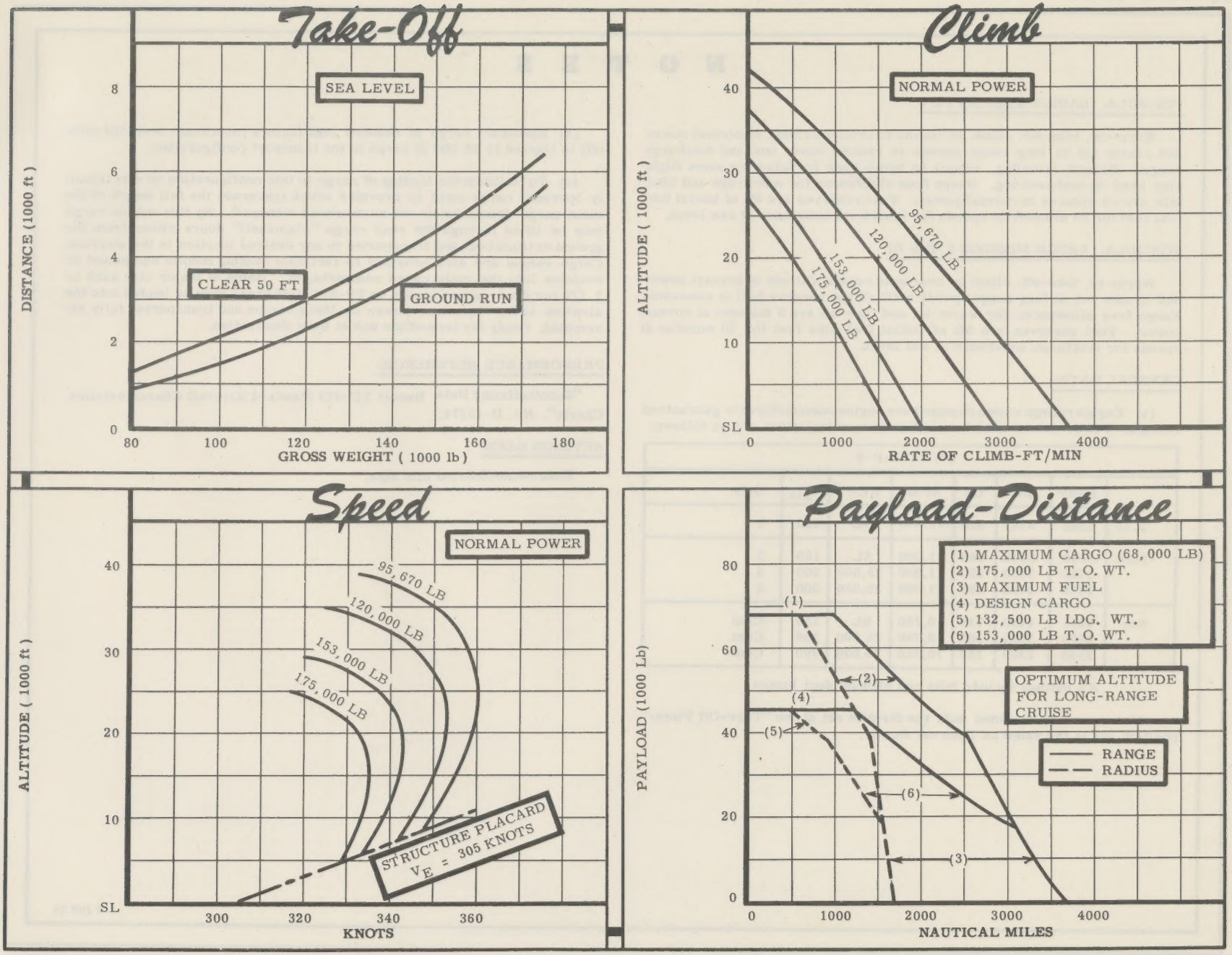
Loading and Performance—Typical Mission

CONDITIONS			BASIC MISSION	NORMAL MISSION	FERRY RANGE
			I	II	III
TAKE-OFF WEIGHT		(lb)	175,000	153,000	136,255
Fuel at 6.5 lb/gal (grade JP-4)		(lb)	44,750	41,350	59,605
Payload (cargo)		(lb)	53,600	35,000	None
Wing loading		(lb/sq ft)	98.9	86.5	77.0
Stall speed (power off)		(kn)	108	101	95
Take-off ground run at SL	①	(ft)	5600	4030	3075
Take-off to clear 50 ft	①	(ft)	6420	4800	3800
Rate of climb at SL	③	(fpm)	1610	2000	2390
Rate of climb at SL (one eng. out)	①	(fpm)	1140	1485	1800
Time: SL to 20,000 ft	③	(min)	20.4	14.4	11.4
Time: SL to cruise altitude	③	(min)	24.6	25.2	25.8
Service ceiling (100 fpm)	③	(ft)	26,000	30,200	33,700
Service ceiling (one eng. out)	②	(ft)	19,300	23,200	26,500
COMBAT RANGE	④	(n. mi)	1705	1848	3665
Average cruising speed		(kn)	287	291	294
Initial cruising altitude		(ft)	22,100	26,600	30,500
Final cruising altitude		(ft)	29,800	33,750	41,500
Total mission time		(hr)	6.0	6.4	12.6
COMBAT RADIUS	④	(n. mi)	1000	1000	—
Average cruising speed		(kn)	290	292	—
Initial cruising altitude		(ft)	22,100	26,600	—
Final cruising altitude		(ft)	41,600	41,600	—
Total mission time		(hr)	7.1	7.0	—
FIRST LANDING WEIGHT	⑤	(lb)	149,270	130,500	—
Ground roll at SL		(ft)	2410	2100	—
Total from 50 ft		(ft)	3700	3280	—
COMBAT WEIGHT	⑤	(lb)	95,670	95,500	81,650
Combat altitude		(ft)	38,750	38,750	41,500
Combat speed	③	(kn)	332	332	334
Combat climb	③	(fpm)	390	400	500
Combat ceiling (500 fpm)	②	(ft)	38,250	38,300	41,400
Service ceiling (100 fpm)	③	(ft)	41,500	41,500	44,900
Service ceiling (one eng. out)	③	(ft)	34,600	34,600	38,400
Take-off ground run at SL	①	(ft)	1380	1380	—
Take-off to clear 50 ft	①	(ft)	1950	1950	—
Max rate of climb at SL	①	(fpm)	3700	3710	4250
Max speed at optimum altitude	③	(kn/ft)	360/24,400	360/24,400	363/25,500
Basic speed at 25,000 ft	③	(kn)	360	360	364
LANDING WEIGHT	⑤	(lb)	80,900	80,750	81,650
Ground roll at SL		(ft)	1300	1300	1310
Total from 50 ft		(ft)	2160	2160	2175

NOTES

① Take-off power
② Max power
③ Normal power
④ Detailed descriptions of Radius and Range missions given on page 6
⑤ For Radius Mission if radius is shown

Performance Basis:
(a) Estimated data
(b) Engine ratings found on page 6


Take-Off
SEA LEVEL
CLEAR 50 FT
GROUND RUN
DISTANCE (1000 ft)
GROSS WEIGHT (1000 lb)
Climb
NORMAL POWER
95,670 LB
120,000 LB
153,000 LB
175,000 LB
ALTITUDE (1000 ft)
RATE OF CLIMB-FT/MIN
Speed
NORMAL POWER
95,670 LB
120,000 LB
153,000 LB
175,000 LB
STRUCTURE PLACARD
VE = 305 KNOTS
ALTITUDE (1000 ft)
KNOTS
Payload-Distance
(1) MAXIMUM CARGO (68,000 LB)
(2) 175,000 LB T.O. WT.
(3) MAXIMUM FUEL
(4) DESIGN CARGO
(5) 132,500 LB LDG. WT.
(6) 153,000 LB T.O. WT.
OPTIMUM ALTITUDE FOR LONG-RANGE CRUISE
RANGE
RADIUS
PAYLOAD (1000 Lb)
NAUTICAL MILES

NOTES

FORMULA: RADIUS MISSIONS I & II

Warm-up, take-off, climb on course to cruise altitude at normal power and cruise out at long range speeds to remote base, land and discharge cargo. Without refueling, return to home base by following same flight plan used on outbound leg. Range free allowances for warm-ups and take-offs are 10 minutes at normal power. Fuel reserves are 5% of initial fuel plus fuel for 30 minutes at speeds for maximum endurance at sea level.

FORMULA: RANGE MISSIONS I, II & III

Warm-up, take-off, climb on course to cruise altitude at normal power and cruise out at long range speeds until all but reserve fuel is consumed. Range free allowances for warm-up and take-off are 5 minutes at normal power. Fuel reserves are 5% of initial fuel plus fuel for 30 minutes at speeds for maximum endurance at sea level.

GENERAL DATA:

(a) Engine ratings shown on page 3 are engine manufacturer's guaranteed ratings. Power values used for performance calculations are as follows:

(4) YT34-P-5							
	ESHP	SHP	LB	RPM	ALT	V_{kts}	MIN
T.O:	5840	5325	895	11,000	SL	150	5
*Max:	5840	5325	895	11,000	SL	150	5
	3750	3350	350	11,000	25,000	300	5
	2470	2180	250	11,000	35,000	300	5
Nor:	4861	4450	715	10,750	SL	150	Cont
	3670	3325	300	10,750	25,000	300	Cont
	2590	2300	250	10,750	35,000	300	Cont

All ratings include inlet and exhaust duct losses

*Max power is obtained with the throttle set at the "Take-Off Power" position and is the same as Take-off Power.

(b) Maximum cargo at reduced load factors (maximum overload take-off) is limited to 68,000 lb cargo in the transport configuration.

(c) To facilitate the loading of cargo in this configuration an electrically operated cargo hoist is provided which traverses the full length of the main cargo compartment on an overhead monorail. By this means cargo may be lifted through the rear cargo "clamshell" doors either from the ground or truck beds and transported to any desired location in the airplane. Cargo ramps are also provided to facilitate loading mobile equipment or vehicles into the main cargo compartment. Items of major size such as 2 1/2 ton 6 x 6 canvas trucks or T9-E-1 light tanks may be loaded into the airplane under their own power on these ramps and transported fully assembled, ready for immediate use at their destination.

PERFORMANCE REFERENCE:

"Substantiating Data Report YC-97J Standard Aircraft Characteristics Charts", Nr. D-15274.

REVISION BASIS:

Data recoordinated this date.

1 JUN 54